

## ARIZONA-SONORA DESERT MUSEUM DIGITAL LIBRARY IMLS NARRATIVE

### 1. PROJECT DESIGN:

The Arizona-Sonora Desert Museum (ASDM) Digital Library project is contributing to the organizational development of both ASDM and its partner, the University of Arizona Libraries (UAL). ASDM's international influence in both informal education and specialized scientific research is propelled forward through this project's digital delivery of previously unavailable scientific information, nomenclature, and images, searchable through a sophisticated, standards-based infrastructure. Additionally, UAL considers the ASDM Digital Library a cornerstone for future repository development and growth.

**Introduction:** For more than 50 years, ASDM has served as the recognized authority on the natural history of the Sonoran Desert region, and has introduced more people to the flora, fauna, and habitats of this area than has any other medium of environmental education in the southwest. The purpose of this proposed project is to expand ASDM's ability to fulfill its mission by bringing expertise, knowledge and resources to an even larger constituency. ASDM, in partnership with UAL proposes to expand digital resources to include aquatic species while infusing knowledge acquired from the current IMLS-funded ASDM Digital Library project. By July 2007, the project will have a searchable, multimedia web-based catalog of terrestrial plants and animals, minerals, landforms, and biotic communities of the Sonoran Desert region the contents of which are currently not accessible digitally. ASDM's digital library is the only existing digital catalog of the Sonoran Desert region, although content and usability are in early development stages.

The entire Sonoran Desert region covers over 200,000 square miles of surface area, over half of which is water. The region includes all of the world's biomes, is home to ca. 5000 species of plants, 60 species of mammals, more than 250 kinds of birds, 20 amphibians, at least 100 reptiles, 30 native freshwater fish, and 1,000 mineral species. Additionally, the Gulf of California (Sea of Cortez) is listed as one of the world's most biologically diverse and productive ocean regions, supporting an estimated 6,500 named species of animal life. This narrow enclosed sea has been explored scientifically since the 1800s and is an integral part of the Sonoran Desert, the only maritime desert in North America. Jacques Yves Cousteau once described the Sea of Cortez as the "Galapagos of North America."

**Long-term Goals:** The long-term goals of this project are to establish and make accessible for the first time a comprehensive digital catalog of authoritative information on the natural history of the Sonoran Desert region, to include:

1. A comprehensive scientific nomenclature for terrestrial and aquatic species of the region;
2. A technical and content infrastructure developed within the context of reusability, persistence, verification, and documentation that can be integrated with other standards-based systems;
3. A digital collection of images, videos, documents, publications, audio, exhibit information, educational materials, and artwork related to the plants, animals, minerals, and biotic communities of this 200,000 square mile region;
4. Multiple interfaces, both public and administrative—including a Spanish mirror-site—that allows collections to be accessed in a variety of ways by broad audiences.

**Phased Approach:** The following is a high-level outline of the phased approach.

|   |  |  |   |   |
|---|--|--|---|---|
| <p><b>Phase I</b><br/>Determine scope of Digital Library;<br/>Form partnership with UAL<br/>(completed 11/04)</p> | <p><b>Phase II</b><br/>Establish technical/scientific standards-based infrastructure for long-term development and sustainability, using terrestrial species as content<br/>(to be completed 7/07)</p> | <p><b>Phase III</b><br/>Use knowledge gained from Phase II to add aquatic and expand terrestrial collection; enhance user interface; implement metadata harvesting protocols</p> | <p><b>Phase IV</b><br/>Introduce tools for teachers and learners; integrate with major search tools; add archival materials</p> | <p><b>Phase V</b><br/>Develop Spanish mirror-site; infuse GPS mapping</p> |
|---|--|--|---|---|

Phase I was completed in 2004 with the development of a prototype system that helped create the initial partnership with UAL. Partners began the final year of Phase II activities in August 2006 with completion on schedule for July 2007. These two phases provide a strong foundation for Phase III activities, which are the focus of this proposal. Major work accomplished in Phase II includes: Compilation of nomenclature databases of terrestrial plant and animal species of the region, including numerous non-taxonomic attributes of the plants to facilitate searches; Creation of nomenclature database structure that accommodates future expansion; selection and installation of hardware and software (scanning stations, web server, application server, etc.); Selection of content management system and implementation of multiple interfaces (public search, data entry, quality control workflow); Establishment of protocols, processes and guideline for digital content production (data transfer, scanning and image manipulation, metadata, cataloging, quality control, copy rights); Selection of terrestrial content (completed collection development policies, image selection guidelines); 5,000 high quality digital images and relevant information available on the Web (by 7/2007); Establishment of a collaborative digital project team with capacity in natural history content, library science, metadata, programming, web design, and project management.

**Phase III Purpose:** The primary purpose of Phase III is to utilize existing scientific and technical infrastructure, and staff knowledge to implement the addition of the Kerstitch Collection of Sea of Cortez marine life images. Beyond this major focus, we will also expand the terrestrial collection produced in Phase II and add additional species narratives and descriptions of diagnostic species attributes. Another priority is to enhance the user interface and search functionalities for audiences at different levels. Finally, ASDM and UAL have been approached by numerous stakeholders who focus their work on Sonoran Desert biodiversity, requesting opportunities for harvesting the ASDM Digital library's metadata, and therefore a metadata harvesting protocol and high-resolution image downloading mechanisms will be implemented in Phase III.

**ASDM/UAL Partnership:** This project is the result of a symbiotic relationship—between ASDM and UAL staff—established during Phase II. The collaboration of Phase II, and the resultant multiple benefits for both parties, support the continuation and expansion of the project. This synergy has created an extraordinary bond between the two organizations' staffs as they have tackled personnel and technical challenges. For example, UAL's dependency on a single programmer to create the entire technical system for the project proved to be problematic. Hence, restructuring of programming duties and technical oversight became the responsibility of a broad technical team. A team-based structure has forged a working relationship that leverages individual initiative, mutual respect, collaborative spirit, and passion for the project. Communication and oversight of the project is equally distributed among all team members. This flat management style has been successful because all participating members at both institutions place high value on the end product and understand the deep importance of the mission.

The relationship supports ASDM staff as content providers and authorities on the natural history of the region, and UAL staff as library science and technology experts. Each offers a resource and capacity that the other cannot duplicate. In fact, the ASDM partnership is one of several that will become the basis for UAL's digital repository of unique source information. It should also be noted that UAL leaders have determined that creating digital repositories such as this one with ASDM, for the benefit of broad user distribution and preservation, is imperative within UAL's strategic long-term goals.

### **Phase 3 Methods:**

**Task 1 – Collection Preparation and Nomenclature Development.** ASDM has been given the superlative collection of professional underwater photographer, Alex Kerstitch, who died in 2001. This well-known marine biologist published his award-winning work in top photo and nature magazines, and authored the influential publication, *Sea of Cortez Marine Invertebrates: A Guide for the Pacific Coast, Mexico to Ecuador*. This collection includes some 10,000 35mm transparencies and covers an estimated 2,000 animal species from the Gulf of California. The digitization process for this collection will include handling, cleaning, sorting, digitizing, uploading TIFF files and JPEG files.

**Task 2 – Detailed Collection Review.** Determine availability of narrative descriptions for metadata of selected species and images in Task 1. Select best quality aquatic images from the digitized Kerstitch collection for cataloguing and uploading into the digital library.

**Task 3 – Standards Application.** Utilize content and image standards previously identified in Phase II. Image selection is based on scientific accuracy, aesthetic value, and image quality. Images selected in the first review will then undergo a second process to verify names of species.

**Task 4 – System Requirements.** Enhance user and system interfaces for the Digital Library. Building on the articulated functionality of user systems developed in Phase II (e.g. range of searchable fields, access control, metadata standards, and controlled vocabularies), UAL staff will execute Phase III utilizing the Open Source software based on user testing and the additional needs of the project.

**Task 5 – Expand Technical Infrastructure.** Utilize and expand standards-based technological infrastructure to accommodate aquatic nomenclature and additional attributes for terrestrial species. Additional equipment will be determined based on current standards requirements and new product availability for storage and preservation purposes. Additional equipment will be housed at UAL and will be dedicated to the ASDM Digital Library project.

**Task 6 – User Interfaces.** Based on usability testing at the end of Phase II, UAL staff will modify; (1) cataloging interfaces for submission and description of contact with linkages to appropriate authority sources; (2) interfaces for creating collection level records, and possibly an automatic process to contribute records to collection registries including OCLC and RLIN; and (3) system interfaces for monitoring usage statistics, recognizing patterns and possible problems with user interface. Customer feedback using focus groups and interviews will be more intensive during Phase III. Interface objectives will allow the public to browse collections and to search for known items.

**Task 7 – Operations.** This task is to apply the operational procedures for the digital library developed and documented in Phase II. The following outlines specifics for Phase III:

- a) System evaluation: Includes reviewing cataloguing module, quality control module, and user search interface implemented to-date (ASDM); quality assurance system testing (UAL)
- b) Selection: Based on established Phased Collection Development Strategy, Phase III will focus on aquatic species from Kerstitch Collection, while continuing to expand terrestrial images for species' images not owned by ASDM.
- c) Copyrights and permissions: Continue to solicit permissions for digitization and public usage of images from new contributing photographers.
- d) Verification of original source image quality: Process, identify and select aquatic images for specific species from the Kerstitch Collection, utilizing the established quality standards developed in Phase II. Selection depends on taxonomic coverage, aesthetic quality and rareness of species represented by the image.
- e) Digital image production: Continue training volunteers to implement digital imaging procedures; perform quality control reviews using professional oversight per Phase II guidelines.
- f) Preservation: Implement established Digital Preservation Plan (Phase II – see appendix) in addition to the standard backup procedure performed regularly on the UAL data system.
- g) Creation of catalog records and collection descriptions: Continue training volunteers to implement cataloguing best practices established in Phase II; control the quality of metadata input using professional oversight; expand species narrative descriptions.
- h) System services: Perform regular backup for ASDM digital library data, service the system based on standard UAL procedures; migrate system and data as necessary at agreed upon service schedule; ensure system performance maintains high level of integrity for users.
- i) User interfaces: Identify/implement new functionalities and improvements to user interfaces based on usability testing results; develop instructional "help page" for users at different levels.

## **2. GRANT PROGRAM GOALS:**

This proposal is submitted under Sustaining Cultural Heritage strategic goals of the MFA Program. This Phase III expansion and enhancement of the ASDM Digital Library will preserve extensive collections of images and associated scientific descriptions of terrestrial and aquatic plants and animals of the Sonoran Desert region, including the exceptional Kerstitch collection of Sea of Cortez underwater images. Expanding the content and technical infrastructure, and enhancing user

interfaces will not only preserve a vast number of images and scientific knowledge and expertise, but will also increase the availability of that knowledge to ASDM's constituents around the world. Digital collections will be accessible online and will fit into the larger context of significant related national and international digital library initiatives.

This project will greatly contribute to sustaining the cultural and natural heritage of the Sonoran Desert region, as well as expanding ASDM's ability to reach a larger cross-section of society with educational information and ASDM's conservation message so that the museum's mission can be fulfilled across a larger demographic area. Not only will ASDM be able to adapt this database of images and knowledge for the creation of new educational outreach programs and research projects, but other organizations, institutions, agencies, and individuals both nationally and internationally will have an opportunity to use this collection to meet their needs. This project will expand on ASDM's existing content to create a great wealth of information for teachers, students, scientists, managers, the general public, and policy makers. In addition, the grave and immediate threat of the loss of species and habitats in the Sonoran Desert makes it vital that the museum expand its capacity to convey its message and preserve existing knowledge to better achieve ASDM's mission. The ability to expand upon and enhance ASDM's digital library can change the way people can teach, do research, make decisions, and learn about and enjoy this unique environment. This new technology will help ASDM to preserve the region's heritage for future generations and expand its reach in ways that were never before imagined.

### **3. HOW THE PROJECT FITS INTO STRATEGIC PLAN AND MISSION:**

The mission of ASDM is "to inspire people to live in harmony with the natural world by fostering love, appreciation, and understanding of the Sonoran Desert." Expanding the ASDM Digital Library content, and scientific and technical infrastructure, and enhancing the user interfaces will allow us to fulfill the museum's mission by enormously expanding our outreach capabilities. ASDM operates in regional, national, and international contexts. ASDM's research staff regularly cooperates with other research scientists at universities, NGOs and governmental agencies throughout the U.S. and Mexico. ASDM's education staff works throughout Arizona and Sonora, Mexico. Museum visitors come from all over the world (70% of our visitors are from out of the area) and staff regularly receive inquiries on Sonoran Desert natural history from interested individuals and organizations. The goal of turning the ASDM Digital Library into a fully functional comprehensive regional database of images and scientific content will allow the museum to have broader scientific influence enhancing its ability to meet both mission and strategic goals.

The ASDM Strategic Plan reviews and clarifies the purpose, mission, and core values of the museum, reports implications on trends analysis, and details an operating plan based on overall goals and trends. The strategic plan specifies the need for ASDM to "move rapidly toward use of technology including effective use of electronic education," and for ASDM to "continue to bring our endeavors to the public through various media opportunities and publications." ASDM Board of Trustees and staff have recognized the importance of using emerging technologies to enhance ability to meet its goals and fulfill the museum's mission. A main goal in the ASDM operating plan is to "...remain the institution best-known for advancing scientific understanding of the desert and shaping people's sense of stewardship." The plan also details specific actions for reaching this goal including "making substantial contributions to the scientific content of our web site every year and completing image galleries of all habitats, vertebrates, invertebrates, and plants in our region and provide captions for the images." The board members and staff that developed the strategic plan specifically recognized the importance of developing a comprehensive digital library to meet ASDM's mission. Completing Phase III of the Digital Library will allow the museum to meet multiple goals at once. It is a permanent, central resource on the Sonoran Desert region that will continue to grow and will be broadly accessible via the internet. The project will ensure that ASDM's collections and knowledge remain available in the future for research, education, and conservation purposes in order to sustain the cultural and natural heritage of this unique region and to advance scientific understanding of Sonoran Desert natural history and ecological processes.

#### **4. STRATEGIC PLAN: PROCESS AND FINANCIAL RESOURCES:**

2003 strategic planning included a two-day retreat with ASDM administration, senior staff, volunteers, trustees, Board Advisors, and invited community constituents. Day one included a review of the 2001-2003 plan, with comments on successes, areas needing attention or resources, and new ideas from the group. Day two was a series of break-out group sessions focusing on specific goal areas, presentations and entire-group discussions of salient points from break-outs, and development of summary consensus statements for each goal area.

The ASDM Executive Officers and Chief Financial officer, 10 ASDM senior staff members of the ASDM Operating Council, and docent and other volunteer representatives were present. The 200-person docent corps is a highly educated group of volunteers, 17 percent of which hold PhDs/MDs, and 30 percent of which hold Master's degrees. Approximately a dozen Board Advisors joined the 25 Trustees for the session. Various community leaders representing key constituencies were also present. The outcome of the 2-day planning process was a revised Operating Plan for 2003-2006. Short- and long-term financial planning and oversight are conducted by the Financial Council of the Board of Trustees, in collaboration with the Executive Officers and Chief Financial Officer, who together establish strategies associated with both the annual operating fund and with long-term investments. The annual operating budget is developed by the Executive and Financial Officers and is guided by the operational plan portion of the ASDM Strategic Plan. The Museum is fortunate to be debt-free. Additionally, ASDM conducted a comprehensive feasibility study within the local community to determine the goal for the recent Capital Campaign. The Campaign (guided by the Strategic Plan) concluded in December 2005 with >\$10 million added to the Museum's endowment, and >\$10 being invested in capital improvements, amounts that greatly exceeded the original goals. The Board Finance Council also recently reviewed the Museum's investment strategies. Late in 2005, the Museum's long-term funds were moved to Northern Trust Bank Investments, and for fiscal year 05/06 these investments earned an annual average exceeding 9%.

#### **5. APPROPRIATENESS OF PROJECT FOR INSTITUTION, AUDIENCE:**

ASDM receives many requests for images, identification tools, and information from the public, teachers, students, scientists, media, agencies, and policy makers. A centralized database meets the needs of the museum's constituents in a more efficient manner than the current method of individual responses to requests. To ensure the project meets the needs of its target audience, Phase II usability studies include both informal and formal testing. Informal testing and feedback gathering have been happening throughout the entire development process. The team adopted a programming methodology, "rapid prototyping." Different from the traditional development cycle of "requirements – development – testing – deliver," this new methodology allows developers to work closely with content provider and end users and adjust system functions constantly based on continuous customer feedback. Specific planning objectives for meeting the needs of various targeted audiences (K-higher education teachers; professional and amateur biologists and naturalists; mineralogists and amateur collectors; publishers; ASDM staff and volunteers; resource managers; government and nonprofit agencies; casual users; English- and Spanish-speaking {a large portion of our constituency} people in all categories) and for evaluating results were developed in Phase II.

The formal usability testing of the Phase II Digital Library is primarily based on the Outcome-Based Evaluation (OBE) logic model. The team completed the OBE planning in the first three months of Phase II by analyzing in detail the stakeholders, audience needs and considerations, desired results and program purpose. An evaluation plan was mapped out with specific outcomes and indicators. Two formal usability studies including focus groups, surveys and interviews will be conducted when the Phase II content development is 70% and 100% completed. The feedback collected during these studies will inform the fine-tuning of the Phase II development, and these improvements will set the foundation for the Phase III expansion. The learning provided by Phase II usability testing will greatly influence the establishment of a programmatic usability program in Phase III, when a sufficient amount of content is available for large scale user testing.

To gain a better sense of the potential for broad usage of ASDM's Digital Library, in May 2006, the project team met with 60 representatives of 50 organizations to explore possible collaborative projects. The discussion centered on ways to leverage information related to the Sonoran Desert

biodiversity. Organizations included Tucson Unified School District, nonprofits specializing in sustainability and environmental advocacy, as well as multiple UA Departments. ASDM and UAL staff presented an overview of the ASDM Digital Library project that sparked broad interest for combining forces and leveraging existing scientific and educational information for research, public distribution and searchability. Specifically, the Tree of Life Web (ToL) project ([www.tolweb.org](http://www.tolweb.org)) a collaborative effort of biologists from around the world utilizing more than 4,000 web pages, provides information about the diversity of organisms on Earth, their evolutionary history (phylogeny) and characteristics has requested access to ASDM Digital Library for harvesting metadata of Sonoran Desert species—one of ToL's deficiencies. Being that this information is otherwise unavailable electronically; participants at the collaborative workshop session validated the need for a sustainable long-term online tool that will be the foundation for expanding and organizing all types of future scientific and cultural information about the Sonoran Desert.

The project team plans to implement the following summarized promotional plan: Engage science and education colleagues in implementing collaborative marketing methods to promote the site. Utilize education professionals to introduce the site to students at all educational levels. Give presentations at museum and library professional conferences as a model for how academic libraries can support unique local source content in partnership with museums or other public education institutions. Publish articles in professional journals and community newsletters to describe the site and methodology for development.

#### **6. PROJECT RESOURCES: TIME AND BUDGET:**

In all areas of the Phase II original timeline, we are on, or ahead of schedule for completion in July 2007. Our partnership with UAL has proven to be a perfect match of skills and knowledge, and we have forged an efficient and effective team. The strength of this partnership will allow us to meet our Phase III goals within the time limits set in the "Schedule of Completion." ASDM has made this a priority project based on the understanding that it will enhance our ability to fulfill our mission and meet our strategic goals. This institutional commitment to the digital library will allow staff to invest a significant portion of their regular work time to ensure the successful completion of this project.

One of the lessons learned in Phase II was the need for a budget allocation sufficient to hire a full-time Project Manager at a salary level that would attract a pool of candidates meeting the requirements of the position. Through the cooperation of UAL and ASDM, we were able—during a lengthy search—to successfully meet the responsibilities of the position with additional in-kind hours supplied by permanent staff. Ultimately, a full time Production Coordinator/Editor with an MLS and digital collection experience, was hired. This individual will step into the full-time Phase III Project Manager position thanks to ASDM's matching funds. One duty of the Project Manager will be to monitor and manage, on a day-to-day basis, the scheduling of work to ensure that all outcomes meets the standards and requirements established by the team, and are delivered on time.

ASDM is extremely fortunate in its ability to attract high-level volunteers. During Phase II many tasks are being accomplished through their in-kind service. The current cadre of volunteers will continue to contribute their skills and knowledge to Phase III, and additional volunteers will be recruited for Phase III as new jobs are identified. All ASDM permanent staff time, and much of UAL's will also be donated to the project.

#### **7. PROJECT RESOURCES: PERSONNEL AND TECHNOLOGY:**

This cooperative project will require a large number of personnel from a variety of fields, including existing staff from UAL and ASDM as well as a new position. In addition, this project is dependent on ASDM's dedicated and talented volunteers. There is substantial institutional support for this project by both partners allowing staff to contribute significant amounts of time to the ASDM Digital Library project. A complete list of project personnel is attached. The list below highlights a few key positions for this project. All digitization standards, guidelines, and procedures that were developed in Phase II will be followed in Phase III.

##### **ASDM**

- **Director of Natural History, Principal Investigator:** Mark Dimmitt is Project Director for the ASDM Digital Library. Dimmitt has a Ph.D. in Zoology and has worked at the ASDM for 25 years,



mostly as a botanist. He is responsible for assuring scientific accuracy and quality of all ASDM operations. Dimmitt has published many articles and books on Sonoran Desert natural history and ecology.

- **Executive Director of Programs:** Richard C. Brusca, Ph.D. is the Co-Director of ASDM and serves on the Digital Library Oversight Committee. Brusca is the author of more than 150 research publications and 10 books, including the largest-selling English language text on invertebrate zoology.
- **Project Manager:** Bill Hornbaker holds an MLS, and will guide the selection, withdrawal or creation, preparation, verification, and quality control of visual material and textual content, and will be responsible on a day-to-day basis for implementing the project schedule and workflow. As a member of the Oversight Committee, he will participate in team decisions.
- **General Curator of Collections:** Craig S. Ivanyi will review collection lists and database lists for the Digital Library and will help to create processes and rules to resolve nomenclature conflicts. He has a Masters in Wildlife and Fisheries Sciences, has worked at ASDM for almost 20 years, and is currently in charge of all collections.
- **Digital Imaging Specialist:** Sloane Haywood was responsible for the initiation and development of Phase I of the ASDM Digital Library and serves on the Oversight Committee. She has a BA in Studio Arts, and advanced studies in Computer Graphic Design. She has been immersed in the design, preparation, organization, and delivery of digital content for over 20 years and will bring this expertise to the project's user interface design, and to image selection, scanning, manipulation, and quality control.
- **Digital Library Volunteers:** We have a wide array of talented volunteers working on this project including one volunteer with a Harvard Law degree, another with a Ph.D. in philosophy and a Photoshop instructor. See attached volunteer resumes and position descriptions.

#### UAL

- **Co-Principal Investigator:** Dr. Barbara Hutchinson, Assistant Dean, UAL Team Leader for the Digital Libraries and Information Systems, will coordinate development and metadata activities and serve as a lead of the Project Oversight Committee. She holds a Ph.D. in Higher Education with a minor in Agricultural Education, and a Masters in Library Science; and a B.A. in History.
- **Co-Principal Investigator:** Sharon Knowlton, UAL Support Systems Analyst, Senior, will be responsible for project management at UAL and coordination with ASDM. She holds an A.S. in Library Science and a B.B.A. in Marketing and Computer Science. Knowlton has 25 years of providing technical support and leadership for libraries, including Online Computer Library Center, in Dublin, Ohio.
- **Information Systems Librarian:** Yu Su holds an M.A. in Library and Information Science from UA, and a B.A. in Economics. Su has extensive experience with digital projects including digital government documents, museum and educational resources, and GIS information. She is the current project manager for the ASDM Digital Library project. She will be consulting with ASDM on metadata, authority sources, and cataloging work processes.
- **Applications Systems Analyst, Senior:** Steven "Nick" Jury will supervise programming of the content management system and will coordinate web application with content management system. He holds a B.S. in Natural Sciences and has extensive experience in database design and server management. He provides database design, development (MySQL, SQL Server 2005, and Oracle 9i); Web applications maintenance/development specific to database development; and systems research, deployment, and development.
- **Applications Systems Analyst:** Kent Duryee will program the public web interface for the digital library. He holds B.A. in History and has 20 years of Microsoft Office experience; and has focused on internet design and technology support for educational systems.
- **Applications Systems Analyst:** Adam Engelsjerd will directly supervise the public web interface programming. He holds a B.A. in British Literature. He has been designing, building, and maintaining websites since 1998 such as building and maintaining the open-access journal website for The Journal of Insect Science (<http://www.insectscience.org/>).

## BUDGET FORM - PAGE FOUR

### Section B: Summary Budget

|                                   | \$ IMLS    | \$ Cost Share | \$ TOTAL COSTS |
|-----------------------------------|------------|---------------|----------------|
| 1. Salaries and Wages             | 73,332.00  | 234,827.00    | 308,159.00     |
| 2. Fringe Benefits                | 21,212.00  | 40,951.00     | 62,163.00      |
| 3. Consultant Fees                | 0.00       | 0.00          | 0.00           |
| 4. Travel                         | 2,523.00   | 0.00          | 2,523.00       |
| 5. Supplies and Materials         | 9,094.00   | 1,350.00      | 10,444.00      |
| 6. Services                       | 27,164.00  | 2,700.00      | 29,864.00      |
| 7. Student Support                | 0.00       | 0.00          | 0.00           |
| 8. Other Costs                    | 0.00       | 0.00          | 0.00           |
| TOTAL DIRECT COSTS (1-8)          | 133,325.00 | 279,828.00    | 413,153.00     |
| 9. Indirect Costs                 | 16,674.00  | 41,569.00     | 58,243.00      |
| TOTAL COSTS (Direct and Indirect) | 149,999.00 | 321,397.00    | 471,396.00     |

### Project Funding for the Entire Grant Period

|                                      |            |
|--------------------------------------|------------|
| 1. Grant Funds Requested from IMLS   | 149,999.00 |
| 2. Cost Sharing:                     |            |
| a. Cash Contribution                 | 39,050.00  |
| b. In-Kind Contribution              | 282,347.00 |
| c. Other Federal Agencies*           | 0.00       |
| d. TOTAL COST SHARING                | 321,397.00 |
| 3. TOTAL PROJECT FUNDING (1+2d)      | 471,396.00 |
| % of Total Costs Requested from IMLS | 32.00%     |

\* If funding has been requested from another federal agency, indicate the agency's name:



# SCHEDULE OF COMPLETION

## ASDM Digital Library Project Phase III

| Task Name   | 2007 |   |   |   |   | 2008 |   |   |   |   |   |   |   |   |   |   |   | 2009 |   |   |   |   |   |   |  |  |  |  |  |
|---|------|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|--|--|--|--|--|
|   | A    | S | O | N | D | J    | F | M | A | M | J | J | A | S | O | N | D | J    | F | M | A | M | J | J |  |  |  |  |  |
| <b>Task 1 -- Collection Development</b>               |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Assess and process the Kerstitch Collection           |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Specify the Phase III collection development strategy |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| <b>Task 2 -- Detailed Collection Review</b>           |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Identify Phase III content                            |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Review and update collection metadata                 |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Identify nomenclature data for aquatic species        |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| <b>Task 3 -- Standards and Authority Sources</b>      |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Identify additional authroity sources for metadata    |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Update scanning & image selection procedure           |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| <b>Task 4 -- System Enhancement</b>                   |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Identify functional requirements for new content      |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Implement metadata harvesting protocol                |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Implement image download mechanism                    |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| <b>Task 5 -- Enhance Technical Infrastructure</b>     |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Select, purchase and install new hardware             |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| <b>Task 6 -- User Interface</b>                       |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Develop a usability study program                     |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Conduct usability studies                             |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Implement enchancements based on feedback             |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| <b>Task 7 -- Operations</b>                           |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Recruit and train volunteers                          |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Recruit subject specialists                           |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Recruit content contributors                          |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Update system evaluation guidelines                   |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Digitization  |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |
| Cataloging  |      |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |   |   |  |  |  |  |  |